

Commonwealth of Kentucky
Division for Air Quality
PERMIT STATEMENT OF BASIS

(DRAFT)

Title V / Synthetic Minor, Construction / Operating

Permit: V-05-017 R1

Texas Gas Transmission LLC - Midland III Compressor Station

Bremen, KY 42325

November 26, 2007

Andrew True, Reviewer

SOURCE ID: 21-177-00066

AGENCY INTEREST: 44340

ACTIVITY: APE20070001

SOURCE DESCRIPTION:

Texas Gas Transmission, LLC Midland 3 Compression Station is the owner and the operator of the plant, which is a major source for emissions of nitrogen oxide (NO_x) and carbon monoxide (CO), and is a minor source for emissions of volatile organic compounds (VOC), particulate matter (PM), sulfur dioxides (SO₂), and hazardous air pollutants (HAPs).

This plant produces liquid hydrocarbons from natural gas pipes entering the plant. Natural gas is currently compressed through the two compressors of 2050 hp each, the third compressor of 2610 hp, and additionally through two Turbine Compressors of 61.21 million British thermal units per hour (mmBtu/hr) each. Permit V-05-017R1 will allow Texas Gas Transmission, LLC Midland 3 Compression Station to construct and operate one additional Turbine Compressor (TB03), replacing two natural gas compression engines (RC01 and RC02).

COMMENTS:

CONTROL TYPE AND EFFICIENCY

EMISSION UNIT	DESCRIPTION	CONTROL DEVICE	POLLUTANT(S)	EFFICIENCY
GD01	Glycol Dehydration System #1	Chemical Oxidation	VOC, Benzene, Ethylbenzene, n-hexane, Toluene, Xylene, & HAPs	95%
GD02	Glycol Dehydration System #2	Chemical Oxidation	VOC, Benzene, Ethylbenzene, n-hexane, Toluene, Xylene, & HAPs	95%
GD03	Glycol Dehydration System #3	Chemical Oxidation	VOC, Benzene, Ethylbenzene, n-hexane, Toluene, Xylene, & HAPs	95%
GD04	Glycol Dehydration System #4	Chemical Oxidation	VOC, Benzene, Ethylbenzene, n-hexane, Toluene, Xylene, & HAPs	95%

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PERMIT REVISIONS:

The following table includes a list of revision applications received by the Division since the renewal application dated October 2003.

Application receiving date	Revision details
June 23, 2004	Significant Revision: Installation of 2 turbines and supporting ancillary equipment. Texas Gas proposed federally enforceable limits restricting total combined operating hours of the two units to 11,600 hours per calendar year to limit the NO _x emission levels to less than 40 tons per year, the PSD significance level. Texas Gas also proposed a federally enforceable limit, which restricts the total combined operating hours of two of the reciprocating compressor engines (RC01 and RC02) to 12,000 hours per calendar year in order to limit the potential formaldehyde emissions to less than the PSD significance level of 10 tons per year. The revision was addressed in the renewal permit V-05-017, finalized on 9/22/05.
June 20, 2007	Significant Revision: Replacing two existing reciprocating compressor engines (RC01 & RC02) with a new compressor turbine (TB03). The capacity of one glycol dehydration system (GD04) will be increased. This project will also include the installation of a new pipeline distillate storage tank (insignificant activity). A new glycol regeneration system will be installed for Dehydrator #4 and will serve contactors #4 and #5. The regeneration system will utilize waste heat from the thermal oxidizer rather than combusting more fuel. Reboiler #4 will be removed. This project will result in a substantial reduction of NO _x emissions from the facility. The project will also result in decreases in potential emissions for CO, VOC, and HAP. Slight increases (less than 1 tpy) in potential emissions of SO ₂ and PM ₁₀ will also result from the proposed changes. The revision will be addressed in permit V-05-017 R1.
*October 22, 2007	Significant Revision: Texas Gas Requested monitoring changes to existing turbines (TB01 & TB02). *Further detail provided below.

* A Significant Permit Modification request dated October 17, 2007 was received by the Kentucky Division for Air Quality in October 22, 2007. Upon review, it has been determined that monitoring changes will not be processed as requested by Texas Gas LLC. Turbines TB01 and TB02 were installed prior to the new NSPS promulgated by the US EPA on July 6, 2006. The turbines (TB01 and TB02) are subject to 40 CFR 60.330-335 (Subpart GG) and 40 CFR 60.8 (Subpart A). Per the revision application received by the Division on June 24, 2004, Texas Gas proposed to accept federal enforceable limits restricting total combined operating hours of the two turbine units to 11,600 hours per calendar year to limit the NO_x emission levels to less than 40 tons per year, the PSD significance level. This limit was based on the units operating in the lean premixed (low NO_x) mode. Pursuant to 40 CFR 60.334(f)(2), whenever one of the turbines is operating, the permittee shall continuously monitor to insure the unit is operating in the lean premixed (low NO_x) mode. Pursuant to 40

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CFR 60.334(f)(2), the records of each turbine's operating mode (lean premixed vs. non-lean premixed) shall be kept for purpose of determining the operation mode. One record shall be required every hour.

MONITORING REQUIREMENTS:

- a. Pursuant to 40 CFR 60.334(f)(2), whenever one of the turbines is operating the permittee shall continuously monitor that it is operating in the lean premixed (low NO_x) mode. This determination shall be based on parameters identified by the turbines' manufacturer. Pursuant to 40 CFR 60.334(g), these parameters shall also be monitored during the performance test required under 40 CFR 60.8 and referenced in the permit (V-05-017-R1).
- b. The total sulfur content monitoring requirements of 40 CFR 60.334(h)(1) and (2) shall be followed, or the owner/operator may demonstrate that the turbines gaseous fuel meets the definition of natural gas in 40 CFR 60.331(u). The owner/operator shall use one of the following sources of information to make the required demonstration:
 - i. The gas quality characteristics data in a current, valid purchase contract, tariff sheet or transportation contract for the turbines gaseous fuel, specifying that the maximum total sulfur content of the fuel is 20.0 grains/100 scf or less; or
 - ii. Representative fuel sampling data, showing that the sulfur content of the gaseous fuel does not exceed 20 grains/100 scf. At a minimum, the amount of fuel sampling data specified in section 2.3.1.4 or 2.3.2.4 of appendix D to part 75 of 40 CFR is required.
- c. For Gas Turbine TB03: Annual performance tests are required pursuant to 40 CFR 60.4340(a) to demonstrate continuous compliance with the NO_x standard. If the NO_x emission result in less than 75% of the standard (18.75 ppmvd @ 15% O₂) then the testing frequency can be reduced to every two years per 40 CFR 60.4340(a). The performance testing must be conducted in accordance with 40 CFR 60.8 and 60.4400.
- d. Per 40 CFR 60.4365(a), a current valid tariff sheet specifying that the natural gas transported (and therefore burned) by this station has a total sulfur content less than 20 grains sulfur per 100 standard cubic feet of gas will demonstrate compliance with the fuel sulfur limit, A copy of the FERC Tariff sheet covering this facility will be kept on-site. As such, the unit (TB03) is exempt from any fuel sulfur content monitoring.

APPLICABLE REGULATIONS:

Emission Unit	Applicable Regulations
Compressor Engine #3 (RC03)	401 KAR 63:020
Gas Turbine (TB01) & (TB02)	401 KAR 63:020, 40 CFR 60.330-335 (Subpart GG), 40 CFR 60.8 (Subpart A)
Gas Turbine (TB03)	401 KAR 63:020, 40 CFR 60 Subpart KKKK, 40 CFR 60.8 (Subpart A)
Glycol Dehydration Units (GD01, GD02, GD03, & GD04)	401 KAR 50:055, 401 KAR 63:020, 401 KAR 63:015
Storage Vessels/ Tanks (TK06 & TK07)	401 KAR 63:020

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REGULATIONS THAT ARE NOT APPLICABLE:

Emission Unit	Non-Applicable Regulations	Reason
Compressor Engine #3 (RC03)	40 CFR Part 63, Subpart ZZZZ	Not major source for HAPs
Gas Turbine (TB01) & (TB02)	40 CFR Part 63, Subpart YYYY	Not major source for HAPs
Gas Turbine (TB03)	40 CFR Part 63, Subpart YYYY	Not major source for HAPs
Glycol Dehydration Units (GD01, GD02, GD03, & GD04)	401 KAR 63:002, (40 CFR Part 63, Subpart HHH)	Not major source for HAPs
Storage Vessels/ Tanks (TK06 & TK07)	401 KAR 59:485	Installed before July 23, 1984

40 CFR 60, Subpart GG is not applicable to TB03, pursuant to 40 CFR 60.4305(b), because 40 CFR 60, Subpart KKKK is applicable.

EMISSION AND OPERATING CAPS DESCRIPTION:

Per 40 CFR 60, Subpart GG, for allowable NO_x emission, the peak load for a turbine in the NSPS is the design capacity at ISO standard condition. The manufacturer's rated heat rate at ISO condition (7,963 Btu/bhp-hr) is used in determining the allowable NO_x concentration. There is no fuel-bound nitrogen in the gas that Texas Gas transports; therefore, the fuel-bound nitrogen allowance will be zero. Following is the calculation for the allowable NO_x concentration for TB01 and TB02:

Rated Heat rate = 11.27 kJ/W-hr

Allowable NO_x Emissions = 0.015 (14.4/11.27) + 0 = 0.0192 vol%

Allowable NO_x Emissions = 192 ppmvd (at 15% O₂)

TB01, TB02, TB03

- According to 40 CFR 60.332(a)(2), emissions of nitrogen oxides from each turbine (TB01 and TB02) shall be less than 192 parts per million volume on a dry basis, corrected to 15 percent oxygen (ppmvd @ 15% O₂).
- According to 40 CFR 60.4320(a), emissions of nitrogen oxides from the turbine (TB03) shall be less than 25 parts per million volume on a dry basis, corrected to 15 percent oxygen (ppmvd @ 15% O₂).
- According to 40 CFR 60.4330(a)(2) the fuel for TB03 must contain total potential sulfur emissions of 0.060 lb SO₂/mmBtu or less.
- The total combined NO_x emission from the turbines TB01 and TB02 must be less than 40 tons per year to preclude the prevention of significant deterioration (PSD) requirements.

Glycol Dehydration Units (GD01, GD02, GD03, & GD04)

- Per 401 KAR 63:015 emissions of particulate matters from each flare shall not exceed 20% opacity for more than three minutes in any one day.
- To preclude applicability of 40 CFR Part 63, Subpart HHH, source wide emissions of total HAPs shall be less than 22.5 tons per year.

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CREDIBLE EVIDENCE:

This permit contains provisions, which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.